a second waveguide physically configured for a signal having one of the same two orthogonal polarizations; and

a polarization plate intermediate said first and second waveguides, said polarization plate having a thickness of approximately one quarter of said wavelength and a slot intermediate said two orthogonal polarizations.

wherein the slotted portion of the polarization plate is offset with respect to the first and second passage.--

REMARKS

The presence of allowable subject matter has been acknowledged. All of the foregoing amendments to the specification and drawings were made in the parent application. No new matter has been added (e.g. the length of the polarization plate was disclosed in original Claim 27. This Preliminary Amendment is filed to continue the prosecution of the application.

The examiner appears to have substantively misread the cited patents and all of the present claims are believable to be allowable over the cited art. The allowance of the application is accordingly solicited.

In one aspect, this application is directed to the problem of attaching an antenna physically configured for a signal having one polarization to a wave guide which may alternatively have the same or an orthogonal polarization. If, in the prior art, the polarization of the waveguide and the antenna were the same, there would be no problem

and no coupler would be required. If, in the prior art, the polarization of the waveguide and the antenna were orthogonal, a coupling was required to effect the polarization rotation. To insure operable coupling, knowledge of the polarization of both the antenna and the wave guide was required, so that one could know whether or not a coupler was required and,if so, what kind of coupler would be required, i.e., horizontal to vertical or vertical to horizontal. In one aspect, the present invention eliminates the need to know the polarization of either the antenna or the waveguide in operably connecting an antenna to a waveguide.

By using a polarization plate with an angle at 45°, i.e., midway between horizontal and vertical orientated polarizations as shown e.g., in Figure 4, the signal passing through the plate effects one 45° rotation as it enters the plate (without regard to the polarization of the wave guide) and effects a second 45° as it exits the plate and enters the antenna (again without regard to the polarization of the antenna). Saying it another way, the direction of the first rotation is automatically determined by the orientation in fact of the waveguide and the direction of the second rotation is automatically determined by the orientation in fact of the antenna.

By way of illustration, assume a vertical polarization (0°/180°) in the waveguide, a horizontal polarization (90°/270°) in the antenna, and a 45° slot in the plate. Note that the operation is a mirror image if the slot in the plate is orientated at 135° rather than 45°, so that the plate cannot be wrongly installed, front or back facing forward and upright or

upside down. The polarization of the wave entering the plate is rotated 45° in the direction as dictated by the relative orientation of the wave guide and slot (in this example clockwise), and the polarization of the wave entering the antenna is also rotated 45° as dictated by the relative orientation of the slot and the antenna (in this example clockwise). Two 45° rotations in the **same** direction effect the 90° rotation to effect coupling of an **orthogonally disposed** antenna and waveguide.

Where the polarization of the wave guide and antenna are the same (either horizontal or vertical), the first 45° rotation may be in either direction and the second 45° rotation will be in the **opposite** direction to effect the desired 0° rotation.

Thus, an antenna of one polarization may be replaced with an antenna of a different polarization without regard to the polarization of the wave guide. As indicated above, the polarization plate may be installed with the first rotation in either direction and that the orientation of the plate need not be changed to install an antenna of either polarization.

The novelty disclosed in the present application has been expressed in several different ways in the claims.

The patent to Nuding, et al ("Nuding") relates to a wave guide junction for connecting together two wave guides whose major transverse axes are inclined to one another. Nuding discloses two waveguides 1 and 2 each having a flange portion 7 and 8, respectively, which connect to one another at a single plane 4. (See column 2, lines 7-15)

The flange portions 7 and 8 each block a portion of the opening in the other (See Fig. 1 and 2b) to thereby create a discontinuity which requires screws 5 and 6 located in the wave guide to compensate for the discontinuity.

The undersigned has been unable to locate in Nuding the "two, equal-amount increments (0 and 4 degree)" referenced by the examiner, and understands that there is a single change in the shape of the wave guide, i.e., at the connecting plane 4 where the facing surfaces of the flanges 7 and 8 abut. Because of the thickness of applicant's plate (• /4 in a preferred embodiment), there are two changes in the shape of the wave guide, i.e. wave guide to plate and plate to antenna, which manipulate the polarization of the signal.

Nuding discloses a system having two components, i.e. waveguides 1 and 2 that are connected at their flange portions 7 and 8, whereas this application discloses a system having three components, i.e. two waveguides and an additional member not disclosed by Nuding.

The patent to Seavey does not remedy the deficiencies of Nuding. The surface 12 shown in Figure 4 is not a polarization plate as asserted, but the surface at the end of the rear launcher section. More specifically, Seavey teaches a horn for radiating circularly polarized energy where the end of the horn is square in cross-section with the plane of polarization so that the polarization of the wave exiting the device is along the diagonal of the square (see Seavey Abstract). The device disclosed in Seavey essentially comprises

of two pieces, the flared horn 14 and the rear launcher 11 which are coupled to one another. While the Examiner asserts that Seavey "shows a polarization plate 12 with an offset slot oriented 45 degrees and similar in geometry to the waveguide coupling and couples to an antenna to provide the desired polarization change", Sealey discloses that the rear launcher 11 is one solid piece and that reference 12 merely is used to refer to the input end of the rear launcher 11.

Since Seavey is directed to elliptical and circular polarization systems, there is no teaching with respect to the substitution of the horn of Seavey for the mating flanges of Nuding. Based on the Examiner's analysis, one skilled in the art would attempt to take the rear launcher 11 and place this between the two waveguides disclosed in Nuding. One skilled in the art would not attempt to combine the two references as the Examiner has in attempting to render the claims obvious. In the absence of some factual foundation, the combination is inappropriate and the rejection must be withdrawn.

Even if the teachings of the cited patents are combined as the Examiner has attempted, the combination would not function in the same manner as the device in the claims. It is clear that the Examiner is improperly attempting the hindsight reconstruction of the claims using teachings found only in the present invention.

The allowance of the independent claims is solicited and the claims that ultimately depend from the independent claims should be allowed without recourse to the additional patentable limitations respectively recited therein.

A further and favorable action and allowance of the application is solicited.

In the event that the application is not found to be in condition for allowance, applicant solicits a telephone call to arrange a personal interview.

Respectfully submitted,

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